SANTA CLARA COUNTY

FLOOD CONTROL AND WATER CONSERVATION DISTRICT

SOUTH ZONE

ENGINEER'S REPORT FOR IMPROVEMENT
OF
UPPER MILLER SLOUGH, LOWER MILLER SLOUGH, AND THROUGH CITY OF GILROY

Project No. S-1-2	Job No. FC 95
Project No. S-1-3	Job No. FC 258

Project Engineer: W. J. Hanna & Sons
Gilroy, California.

Approved: WJHanna
W. J. Hanna, R.C.E. 3704

ADVANCE COPY
SUBJECT TO REVISION

Preliminary Approval: ______________________
George H. Prime
Supervising Engineer,
Flood Control Section

Final Approval: ______________________
Leonard Bushnell, County Engineer

MICROFILMED
12-1967
PG 17 OF 41

MILLER SLOUGH - GENERAL

SANTA CLARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

SOUTH ZONE

ENGINEER'S REPORT FOR THE PROPOSED IMPROVEMENT OF THE UPPER MILLER SLOUGH LOWER MILLER SLOUGH, AND THROUGH CITY OF GILROY

INTRODUCTION:

The Miller Slough, or West Llagas Creek, originates in the mountains west of San Martin and flows in a southeasterly direction towards the City of Gilroy crossing the main part of town in a southeasterly direction. It reaches the City of Gilroy in an inadequate ditch just north of Welburn Avenue, about 1200 feet west of 101 Highway, and crosses the Highway just north of the Catholic Church, running under the lumber sheds of the Builders Supply Company and the Southern Pacific Railroad Tracks. From this point the slough follows the easterly side of the Railroad southerly to a point just north of the Filice & Perrelli Canning Company. It then runs easterly under Forest, Lewis, and Sixth Streets, leaving the easterly City Limits near the Bridge into the P. G. & E. Company substation. After leaving the City Limits the slough is forced easterly along an old wooden bulkhead that completely obstructs the flow; turning southerly the slough crosses the Pacheco Pass Road just west of the Gentry Dehydrated Food Plant and proceeds to a junction with the main Llagas Creek about 200 feet north of the north boundary of the City of Gilroy Sewer Farm.

The Miller Slough drains about 16 square miles of land. Most of the basin, some 12 square miles, lies west of the Monterey Highway. One fourth of the drainage basin is mountainous while the remainer is quite flat. Flooding occurs in the following area:

MICROFILMED
12-1967
PG 13 OF 41

a. In the vicinity of Morey, Kern, and Wren Avenues, adjacent to the several branches of the slough in this area.

b. At the crossing of the Day Road.

c. Along the slough at several points between the Day Road and the Monterey Highway.

d. In Gilroy at the High School Grounds and the area east of Forest Street. Also across 101 Highway at the north City Limits to the point of blocking traffic.

e. South and east of Gilroy the fields on both sides of the Pacheco Pass Highway suffered severe damage in the storm of December 1955.

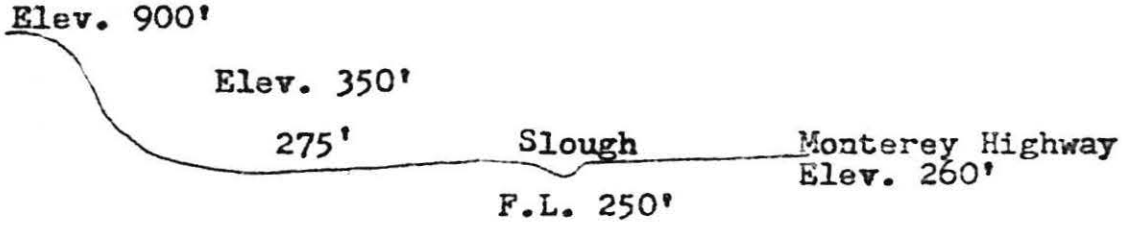
Extensive development is in progress in the form of subdivisions, commercial establishments, and conversion of grazing land to strawberries. Many of the commercial establishments are being built in the are opposite to the Be Ge Plant where severe flooding occurred in December 1955. The subdivisions and strawberries are going in along the upper Miller Slough and its tributaries.

Most of the flooding north of Gilroy in the storm of December 1955 occurred in undeveloped areas. This area served as a detention basin and was covered by two to three feet of water. This area is now in the process of development as described above.

MICROFILMED
12-1967
PG 14 OF 41

TOPOGRAPHY, SOILS, AND VEGETATION

The topography of upper Miller Slough is steep in the West and very flat in the area adjacent to the slough. It falls from an elevation of 1100 feet to 300 feet at Highland Avenue in a distance of a mile and one half. The sketch below portrays a typical East-West Cross Section:



The soil is laced with type A-5, which is relatively impervious and type A-4, a soil ranging from a sandy silt to sandy clay. The mountains are lightly wooded. There is a fair amount of grass on the hillsides and fields which are not under cultivation. There is a fair amount of area in orchards and strawberries.

The area is drained by three main branches of Miller Slough. The junction of these three branches in near the northerly City Limits of the City of Gilroy and just easterly of Wren Avenue. The area has many low pockets and stores considerable water during the rainy season. The area in the City of Gilroy and to the east and south is very flat and impervious. The soil is mainly type A-5. The farming is in row crops. The area just north and east of the City of Gilroy also contributes several small waterways that are fed by a sheet-run-off after the saturation point is reached. This area contributed a large share of the flooding in the City of Gilroy during the December 1955 flood. East of

MICROFILMED
12-1967

the City of Gilroy, midway between the City and the Main Llagas Creek, is a broad swale that normally carries very little run-off, but is the channel followed by the overflow waters of the Llagas Creek when the levee along the west side of the Creek is topped north of Leavesley Road. This did not occur during the 1955 flood, but has in the past.

GENERAL LOCATION OF PROPOSED PROJECTS:

This report covers the proposed improvement of the Miller Slough from the Day Road to the Llagas Creek and has been broken down into four separate projects as follows:

1. Improvement of the Upper Miller Slough from Day Road to the northerly City Limits of Gilroy.
2. Improvement of the Lower Miller Slough from the easterly City Limits of Gilroy to the Llagas Creek.
3. Improvement of the Miller Slough through the City of Gilroy.
4. Diversion of the Miller Slough from it's present location in the City of Gilroy, commencing at the point where it emerges from the Southern Pacific Railroad Tracks and following a route easterly just north of the High School Grounds and then turning southerly along the easterly line of the Las Animas Rancho to a junction with the present slough just east of the P. G. & E. Company Substation Bridge. This diversion will be discussed on the basis of two possible projects. Project number one would be a complete diversion of the Miller Slough and would pick up the drainage area north and east of the High School Grounds. The second project would pick up the area north and east of the High School Grounds only and reduce the improvement necessary in the present slough.

MICROFILMED
12-1967
PG 15 OF 41

PURPOSE:

The purpose of this report is to describe the remedial measures necessary to control flooding from storms whose frequency of recurrence is about once every 15 years. Structures have been studied in sufficient detail so that an intelligent estimate can be made of the cost of construction based upon rates current December 27, 1955.

DESCRIPTION OF PROPOSED IMPROVEMENT TO UPPER MILLER SLOUGH: PROJECT NO.1

The upper Miller Slough diverges into several channels north of the Gilroy City Limits in the vicinity of Wren and Ronal Avenues. One branch which has been designated the EAST BRANCH originates in the area just west of the Monterey Highway and south of San Martin. It approximately parallels the Highway and in general is about a half mile west of it, first appearing as a definite channel just north of Fitzgerald Avenue. The east branch continues southerly crossing the Day Road, Farrell Avenue and Ronan Avenue, entering the main Miller Slough between Wren Avenue and Welburn Avenue. The project considered here begins at the Day Road with the replacement of the ocrrugated metal pipe culverts with a new concrete box culvert of adequate size and the construction of a new trapezoidal channel having a 10 foot bottom width, 1½:1 side slopes, and 6.8 feet deep, southerly to a junction with the main slough. New concrete box culverts will also be required at Farrell and Ronal Avenues. This channel will follow very close to the present alignment of the existing channel. The land is rather highly developed for farming purposes and right of way costs have been estimated accordingly. The cost of right of way should be mitigated by the fact that the improvement of the channel will be a direct benefit to all property owners along the channel and there will be no additional severence of proper

MICROFILMED
12-1967
12 OF 41

The second branch considered for development is termed the MURPHY LANE BRANCH for the purposes of this report. This branch roughly parallels the foothills about a half mile distant therefrom, and carries most of the run-off from the westerly hills beginning at Highland Avenue and extending southerly to the Day Road. It first appears in a definite channel in the nature of deep drainage gutters along both sides of Murphy Lane, branching into a definite channel just north of the intersection of Murphy Lane and the Day Road; this channel crosses the Day Road about 200 feet west of Murphy Lane and crosses the Day Road twice again before running southeasterly to a junction with the main slough just east of Wren Avenue, crossing Kern, Tatum and Wren Avenue on the route. It is proposed to realign a major portion of this channel beginning at the crossing of the Day Road just west of Murphy Lane. A new channel having a 12 foot bottom width, 1½:1 side slopes and 5.5 feet deep, would be constructed southerly and parallel to Morey Avenue to a point about 1250 feet southerly of the intersection of Morey Avenue and the Day Road; The channel would then curve to the east, cross Morey Avenue in a new box culvert and intersect the present channel at a point about 1000 feet east of Morey Avenue; the present channel would then be followed with the exception of one minor diversion to a point just north of Tatum Avenue; from this point a new channel would be constructed along existing property lines to a junction with the new channel of the Morey Avenue Branch which will be discussed later in this report. New box culverts will be required at Morey Avenue, Kern Avenue, and Tatum Avenue. Right of way should be of nominal cost as all but a small portion of the right of way is over poor quality land, though some severance damages

MICROFILMED
12-1967
PG 12 OF 41

will no doubt be encountered.

The third branch considered for development has been termed the MOREY AVENUE BRANCH for the purpose of this report. There are actually two branches of the Miller Slough that extend from Wren Avenue westerly to Morey Avenue. The southerly of these two branches has not been considered in this report, but has been left for future consideration or for local improvement. The northerly of the two branches is the one considered in this report and carries the major portion of the drainage west of Morey Avenue and south of the Day Road. The major runoff in this channel comes out of the canyon entered by the Day Road west of Morey Avenue and is a small creek of considerable runoff at peak storm periods. It is proposed to improve this channel commencing with a new and adequate box culvert at Morey Avenue and constructing a new trapezoidal channel with 10 feet bottom width, 1½:1 side slopes, and 5.8 feet deep, easterly to Kern Avenue, more or less along the existing alignment. A new box culvert would be constructed at Kern Avenue and a new channel constructed at Kern Avenue and a new channel constructed along property lines to Wren Avenue, picking up the channel of the Murphy Lane branch discussed above midway between Kern and Wren Avenues. At Wren Avenue a new box culvert would be constructed and the channel would then follow the easterly side of Wren Avenue to a junction with the existing main slough and improved along the main slough to Welburn Avenue. Right of way cost should be very nominal from Morey Avenue to Kern Avenue and slightly higher from Kern to Wren Avenues. Practically no new severance will be encountered.

MICROFILMED
12-1967
PG 19 OF 41

UPPER MILLER SLOUGH

ESTIMATE OF COST OF IMPROVEMENT OF THE EAST BRANCH

ITEM	QUANTITY AND DESCRIPTION	UNIT PRICE	TOTAL
1.	25,293 Cubic Yards Channel Excavation	0.35	$ 8,850.00
2.	4 Reinforced Concrete Box Culverts	3,000.00	12,000.00
3.	3 Farm Bridges	2,100.00	6,300.00
	Construction Total		$27,150.00
	Cost of Right of Way (Lump Sum)		8,615.00
			$35,765.00

ESTIMATE OF COST OF IMPROVEMENT OF THE MURPHY LANE BRANCH

ITEM	QUANTITY AND DESCRIPTION	UNIT PRICE	TOTAL
1.	20,000 Cubic Yards Channel Excavation	0.35	$7,000.00
2.	3 Reinforced Concrete Box Culverts	3,000.00	9,000.00
3.	2 Farm Bridges	2,100.00	4,200.00
	Construction Total		$20,200.00
	Right of Way; 8.29 acres @ 1,000.00		8,290.00
	Project Total		$28,490.00

ESTIMATE OF COST OF IMPROVEMENT OF THE MOREY AVENUE BRANCH

ITEM	QUANTITY AND DESCRIPTION	UNIT PRICE	TOTAL
1.	33,530 Cubic Yards Channel Excavation	0.35	$11,710.00
2.	4 Reinforced Concrete Box Culverts	3,000.00	12,000.00
	Construction Total		$23,710.00
	Right of Way (Lump Sum)		11,700.00
	Project Total		$35,410.00

MICROFILMED
12-1967
PG 20 OF 41

Combined Cost of the Three Branches $99,665.00

SUMMARY:

In the consideration of any improvements to the channels of the Miller Slough from San Martin to the Llagas Creek it is important to keep in mind that the Miller Slough and it's tributaries are the main drainage channels for a major portion of the southern Santa Clara Valley. In the present condition some severe flooding has occurred ruing major storms. The flooding is getting progressively worse as the nature of the land uses change. Any trend towards subdivision in the area west of 101 Highway and South of San Martin will create a major catastrophe without improvement of the Miller Slough. It is of primary importance that the right of way for the various channels be acquired and protected before any further obliteration or obstruction occurs. If funds for construction are limited and the projects must be done by stages it is recommended that the following priorities be followed:

1. Improvement of Lower Miller Slough
2. Improvement of Miller Slouth through City of Gilroy
3. Improvement of East Branch of Upper Miller Slough
4. Improvement of the Morey Avenue Branch of Upper Miller Slough
5. Improvement of the Murphy Lane Branch of Upper Miller Slough

MICROFILMED 12-1967 PG 21 OF 41

It is further recommended that ~~further~~ ADDITIONAL investigation be made with a view to construction OF flood control and water conservation dams on the Highland Avenue Creek and on the Day Road Creek. The possibility of the construction of ponding areas along the westerly foothills west of Morey Avenue and Murphy Lane should also be investigated.

PROJECT NO. 2

DESCRIPTION OF PROPOSED IMPROVEMENT TO THE LOWER MILLER SLOUGH:

The improvement to the Lower Miller Slough is proposed to begin at Station 0 + 00 at the P. G. & E. Company Bridge over the Slough and run southeasterly to the Llagas Creek. From Station 0 + 00 the channel will follow a portion of the present alignment until the wooden bulkhead mentioned above is reached. This bulkhead is along the line common to Lots 4 and 5 of the "Elizabeth H. Martin Tract". From this point to Station 44 + 00 the channel will be realigned to a location very near to the natural channel if not disturbed by man. This will be trapezoidal channel with 25 foot bottom width, 1½:1 side slopes, and 9.2 ~~feet~~ deep. From Station 44 + 00 to Station 80 + 50 about 2100 feet south of the Pacheco Pass Road a trapezoidal channel will be required having 28 foot bottom width, 1½:1 side slope, and 9.5 feet deep. From this point to Station 116 + 00 at the Llagas Creek a trapezoidal channel will be required having a 30 foot bottom width, 1½:1 side slopes, and 9.6 feet depth. No major structures are required for this project. The bridge on the Pacheco Pass Road, a State Highway, has adequate flow area, but may need underpinning of the foundations. It is believed that the Division of Highways will take care of this portion of the work. The land is all in row crop farming and the cost of right-of-ways are estimated on that basis. The estimate Cost of Construction follows:

MICROFILMED
12-1967
PG 22 OF 41

ESTIMATE OF COST

ITEM	QUANTITY AND DESCRIPTION	UNIT PRICE	TOTAL
1.	124,000 Cubic Yards Channel Excavation	0.35	$43,400.00
2.	5 Farm Bridges	2,100.00	5,500.00
	Total Construction Estimate		$48,900.00
	Right of Way 22 Acres @ $1,500.00		33,000.00
	Total Cost of Project		$81,900.00

PROJECT NO. 3:

DESCRIPTION OF PROPOSED IMPROVEMENT TO EXISTING MILLER SLOUGH THROUGH THE CITY OF GILROY AND ESTIMATE OF COST:

The improvement of the existing Miller Slough through the City of Gilroy is proposed to begin at the centerline of Welburn Avenue and proceed southeasterly through the City to the bridge over the slough at the P. G. & E. Co. substation. Acquisition of rights of way and disposal of excavated material will prove the most difficult problems. Existing bridges are very close to being adequate though some foundation work will probably be necessary. Where the channel passes under the lumber sheds of the Builders Supply Company some major work will be necessary and concrete lining may be required. the bridge over I.O.O.F. Avenue is adequate in area. The bridge over Forest Street is adequate in flow area, but is a hydraulic nightmare as the bridge was built on a considerable skew to accomodate the old channel and the skew is reversed from the present direction. It is advisable if finances permit to consider a new bridge over Forest Street though satisfactory results can probably be obtained with the present bridge. The bridge over Lewis Street consists of two corrugated plate arches and one pipe arch which will fall somewhat short of the required

MICROFILMED 12-1967
PG 23 OF 41

capacity in addition to being unsound from a hydraulic standpoint. It is recommended that this bridge be replaced with an adequate clear span bridge adapted to the new channel. The bridge over Sixth Street has adequate opening and will require underpinning of the foundations. The bridge over the slough to the P. G. & E. substation will require replacement. The improvements to the channel are as follows: From Station 0 + 00 at the centerline of Welburn Avenue to Station 23 + 50 at the Southern Pacific Railroad Tracks; construct a trapezoidal channel with 20 foot bottom width 1½;1 side slopes, and 9.4 feet depth. From Station 23 + 50 to 86 + 77 at the P. G. & E. Bridge; construct trapezoidal channel with 20 foot bottom width, 1½:1 side slopes, and 9.8 feet depth.

ESTIMATE OF COST

ITEM	QUANTITY AND DESCRIPTION	UNIT PRICE	TOTAL
1.	34,163 Cubic Yards Channel Excavation	0.35	$11,957.00
2.	10,100 Cubic Yards Excavation & Embankment	0.70	7,070.00
3.	Re-work crossing under Builders Supply Co.		4,000.00
4.	New Bridge at Forest Street		15,000.00
5.	New Bridge at Lewis Street		15,000.00
6	Underpinning Sixth Street Bridge		4,000.00
7	New Bridge for P. G. & E. Company		9,000.00
	Construction Total		$66,027.00

A careful analysis of the costs of right of way has not been made at this time, but with the alignment following the present channel there should be no cost of acquiring the portion covered by the existing channel. The recommended improvement requires an average of 10 feet

ICROFILMED
12-1967
PG 26 OF 41

additional width per lineal foot of channel. Right of way has been estimated on the basis of the average value of older residential lots in the City of Gilroy.

Right of Way 87,000 Sq. Ft. @ 0.30	$26,100.00
Total Cost of Project	92,127.00

PROJECT 4-A

DESCRIPTION OF PROPOSED DIVERSION OF MILLER SLOUGH IN CITY OF GILROY:

The improvement of the Miller Slough by diverting to a new location beginning just easterly of the Southern Pacific Railroad is proposed to be a trapezoidal channel with a 20 foot bottom width 1½:1 side slopes, and 9.8 foot depth. The improvement of the channel from Welburn Avenue to the beginning of the diversion would be the same as described in Project 2 above. The right of way would run southeasterly just south of the cattle sheds at the Gymkhana Grounds, cross Swanston Lane and Forest Street; thence easterly along the northerly side of the Gilroy High School Property to the P. G. & E. High Tension Laine along the Las Animas Ranch Line; thence southerly to a junction with the existing Miller Slough on the south side of Gilman Road just easterly of the P. G. & E. Bridge over the Miller Slough. The City of Gilroy has agreed to the closing of Forest Street through the High School Grounds if the School replaces it with a street further east. This will leave the present Forest Street and Swanston Lane dead ended and it is possible that no bridge will be required over the present streets. A new bridge will be required over the proposed new location of Forest Street as well as a new bridge at Gilman Road. Right of way will be expensive until Swanston

CROFILMED
2-1967
G 24 OF 41

Lane is crossed, thereafter the right of way should be acquired at a price varying from $3,500.00 per acre to $2000.00 per acre. This project has the advantage of cutting off all waters from the north and east that have flooded the High School and the area northeast of Forest Street in the past, and also keeps the construction work and right of way out of the confined location present on the existing channel.

ESTIMATE OF COST

ITEM	QUANTITY AND DESCRIPTION	UNIT PRICE	TOTAL
1.	77,000 cubic yards channel excavation	0.35	$ 27,000.00
2.	2 Reinforced Concrete Bridges @	$15,000.00	30,000.00
3.	2 Farm Bridges	2,000.00	4,200.00
	Construction Total		$ 61,200.00
	Right of Way Welburn Avenue to Railroad Tract 23,000 square feet @	.30	6,900.00
	Right of way from Railroad Tract to Forest Street		15,000.00
	Balance of Right of Way 3 acres @	$3,500.00	10,500.00
	6 acres @	2,000.00	12,000.00
	Project Total		$105,600.00

MICROFILMED
12-1967
PG 25 OF 41

PROJECT 4-B

DESCRIPTION OF DIVERSION PROJECT RECOMMENDED TO ACCOMPANY PROJECT 2:

Should the Miller Slough be improved in the present location it is still recommended that a portion of project 4-A be constructed to divert the water north of the High School Grounds and provide drainage for the future development of the area northeast of the City of Gilroy. This project would consist of a trapezoidal channel with a 8 foot bottom width, 1½:1 side slopes, and 5.0 foot depth, commencin~~t~~g approximately 250 feet east of Forest Street as shown on the plans and follow the same route to the Miller Slough. There are two existing 30" culverts under Forest Street that carry water west, through the High School Grounds, entering Miller Slough approximately 650 feet southerly of the Railroad Bridge. It is suggested that these existing 30" culverts be used as overflow structures furthering the drainage flood protection for Gilroy High School and any future local development. Only one bridge would be required at Gilman Road which could be a box culvert, and a large culvert will be required under the new location of Forest Street. The cost of right of way is greatly reduced.

ESTIMATE OF COST

ITEM	QUANTITY AND DESCRIPTION	UNIT PRICE	TOTAL
1.	10,800 Cubic Yards Channel Excavation	0.35	$ 3,770.00
2.	1 Box Culvert @ Gilman Road (Lump Sum)		3,500.00
3.	50 Lineal Feet 30 Inch C.M.P.	9.00	450.00
	Construction Total		$ 7,720.00
	Right of Way 2 Acres @ $3,500.00		7,000.00
	4 Acres @ $2,000.00		8,000.00
	Project Total		$22,720.00

MICROFILMED
12-1967
PG 26 OF 41